INTELLECTUAL PROPERTY

Court Tells Nichia to Pay Blue LED Inventor $180 Million

TOKYO—Japanese courts last week delivered stunning monetary awards to two corporate researchers who claimed that they had received inadequate compensation for inventions produced for their employers. The plaintiffs hailed the victories as progress on the road to better treatment for corporate scientists. But others warned that the awards could spell the road to ruin for companies by undermining the potential payoff of a breakthrough discovery.

In the most eye-popping decision, handed down on 30 January, the Tokyo District Court awarded $180 million to materials scientist Shuji Nakamura for his development of a blue light–emitting diode (LED) while employed by Nichia Corp. of Anan, Tokushima Prefecture. That's a million times more than the $180 that the company originally paid Nakamura, now a professor at the University of California, Santa Barbara, for the rights to a key LED patent. In a separate case decided 1 day earlier, the Tokyo High Court ordered Hitachi Ltd. of Tokyo to pay $1.5 million to former company researcher Seiji Yonezawa for three key technologies that are at the heart of CD players and other optical disk devices.

Katsuya Tamai, a professor of intellectual property law at the University of Tokyo, says the decisions reflect the ambiguity in existing patent laws. Currently, patents are given to individuals, who may cede rights to their employers in exchange for "reasonable" compensation. The two recent cases hinged on the definition of that term, which is not spelled out in the law. Although a growing number of researchers have won suits that allege they have been treated unfairly by their companies, until now the awards have been small.

Money talks. Shuji Nakamura (left) and his lawyer speak to the media after a court awarded him $180 million.

What may have tipped the scales in the Nakamura case is the fact that LEDs are a multibillion-dollar industry. Blue LEDs can be combined with previously developed red and green LEDs in giant outdoor displays and to produce white light devices that could supplant conventional light bulbs. The court determined that Nichia had earned more than $1.1 billion in profits from the technology since it was commercialized in 1993. In the Hitachi case, the appellate court took the unusual step of quadrupling the award of a lower court, which had ruled that Yonezawa was entitled to a slice of the company's domestic licensing but not its foreign activities.

Nichia, in a statement posted on its Web page, criticized the court decision for an "excessive" interpretation of the provisions of the patent law. It has already appealed the ruling. (Hitachi is also planning to appeal to the country's highest court.) In the meantime, Japan's leading daily economics newspaper, *Nihon Keizai Shimbun*, called the rulings "out of touch with the realities [of business] in Japan." It warned that a rash of such verdicts could "strip profits from many technology-oriented companies." Tamai says he worries that more large awards could pressure corporations to move their laboratories offshore. What's needed, he says, is reform of the patent law.

Not surprisingly, Nakamura offers a more positive take. Larger awards, he told a press conference, will create financial incentives for scientists "that will have everyone striving to make discoveries. … I think this will fuel the dreams of young people interested in science."

–DENNIS NORMILE

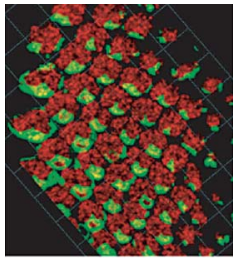
GENETICS

Development Gene May Give Nerve Cells a Sense of Identity

Under the microscope, it's hard to tell brain cells apart. But similarities can be deceiving: Neurons acquire unique identities during development, each finding its correct place in the brain and connecting with the appropriate neighbors. A new study suggests that, in fruit flies at least, a gene called *Dscam* has the flexibility to endow specific groups of neurons, even individual cells, with "Hello, my name is" tags. The gene comes in 38,000 flavors.

Like many genes, *Dscam*, which stands for Down syndrome cell adhesion molecule, consists of protein-coding regions called exons interspersed with noncoding regions. It has more than 100 exons, some of which—or even fragments of which—can become active separately in a process called alternative splicing. Each combination of expressed gene segments creates a different protein. (In humans, *Dscam* lacks the variability seen in its insect versions.)

Although immune system genes were known to mix and match their exons, researchers were initially surprised to find another gene in which so many combinations were possible, says evolutionary developmental biologist Andrew Chess of the Massachusetts Institute of Technology (MIT). To track the variations, the team used DNA microarrays, which reveal which genes are most active in a given sample. Chess, MIT's Guilherme Neves, and colleagues assessed the activity of about 19,000 *Dscam* variants possible from the three most readily divisible exons. They exposed the microarray to genetic material belonging to fruit fly embryos, larvae of different stages, and adults.



Alternatives. Combinations of three *Dscam* exons in these neurons' photoreceptors (red) make possible 19,000 individual identities.

Different combinations of *Dscam* variants were active at different ages, the researchers report online this week in *Nature Genetics*. They also found variety in *Dscam* patterns among individual neurons. Further analyses showed that each variant formed independently of the others and that the patterns of gene expression were somewhat random. The variability "may help each cell know it's different from its neighbor," Chess proposes.

"This is the first evidence for the possible presence of distinct *Dscam* molecules in individual [nerve] cells," says Tzumin Lee, a cell biologist at the University of Illinois, Urbana-Champaign. Next, the team hopes to demonstrate "whether and how the presence of distinct *Dscam* molecules helps provide for the huge diversity and specificity in the central nervous system."

–ELIZABETH PENNISI

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